REMARKS

In paragraph 1 of the Office Action, claim 5 is objected to because it "claims a control signal", and claim 6 is objected to because it "claims control means (which actually produces such a control signal)". Accordingly, to overcome the objection to claim 5, that claim is modified such that it does not claim any control signal. Instead, claim 5 as modified claims "a means for receiving one control signal". This "means for receiving" is a physical thing, such as the electrical conductors which receive the signals R1C1 through R3CN that are shown on the left side of Fig. 2 in the present application.

Thus in claim 5 as modified, the conductors which carry the control signals are claimed, but the control signal, themselves are not claimed. Then in claim 6, one particular "closed-loop control means" is added to claim 5; and in claim 7, another particular "closed-loop control means" is added to claim 5. These claims 6 and 7, as originally filed, are free of "informalities" and properly narrow the scope of claim 5.

The original claims 8 and 9 are also dependant on claim 5. Thus, since the language of claim 5 was modified, the corresponding language in the dependant claims 8 and 9 is also hereby modified in the same manner.

Also, the original claim 10 claimed a control signal just like the objected to claim 5 claimed a control signal. So in this amendment, claim 10 is modified to recite "a means for receiving one control signal" and thereby claim the conductor (a physical thing) rather then the control signal. Then in claim 11, one particular "closed-loop control means" is added to claim 10.

Based on the above remarks, none of the presently active claims should now have any "informalities". So the

objection in paragraph 1 of the Office Action should now be overcome.

Next, in paragraphs 2-3 of the Office Action, claims 1-4 and 13 are rejected under 35USC102(e) as being anticipated by Cader et al (US2004/0032274A1). To support this rejection, paragraph 3 of the Office Action attempts to correlate Fig. 3 of Cader et al with the language of the present claims 1-4 and 13. However, it is respectfully submitted that this correlation is in error, as will now be explained.

The present claim 1 calls for "a pressure reducing means, coupled to said container, for producing a sub-atmospheric pressure between said container and said IC-module when said seal is pressed against said IC-module". This pressure reducing means, according to paragraph 3 of the Office Action, corresponds to item 365 in Fig. 3 of Cader et al. See lines 4-7 on page 3 of the Office Action.

But inspection of Fig. 3 in Cader et al shows that item 365 is a pump which injects coolant into the container 325 when the seal 330 is pressed against the IC-module 360. When the seal is initially pressed against the container, the pressure inside the container will be atmospheric. Later, when the pump 365 injects coolant into the container, that injected coolant can only cause the pressure inside the container to increase. Thus, pump 365 cannot be "a pressure reducing means . . . for producing a sub-atmospheric pressure . . ." as is recited by claim 1.

To remove the injected coolant from the container 325, Fig. 3 shows a second pump 380 and a solenoid valve 385. However, the text in Cader et al indicates that the resulting pressure inside the container 325 always stays at or above atmospheric pressure.

In particular, see lines 5-9 of paragraph 41 which says the "solenoid valve 385" is used "to obtain the appropriate coolant boiling point inside the spray chamber". But Fig. 3 shows that the valve 385 merely opens to the atmosphere, and thereby allows vapor in the container 325 to escape to the atmosphere. This escaping vapor is indicated in Fig. 3 by the arrow at the left side of the valve 385. Thus, the use of the valve 385 to control the boiling point inside the container 325 will only work if the pressure inside the container is above atmospheric pressure.

See also lines 11-14 of paragraph 37 which says the pressure inside the container is "typically at about 1 atm.". Also see lines 1-6 of paragraph 39 which says the coolants have a "high vapor pressure" which "evaporate readily when exposed to atmospheric condition".

The only place where Cader et al mention "sub-atmospheric" pressure occurs in lines 14-15 of paragraph 37. But there, Cader et al is describing the pressure inside of the "sealed chiller reservoir 390". Fig. 3 shows that before the coolant in the chiller reservoir 390 can be sprayed onto the IC-package 360 in the container 325, that coolant must pass through a "liquid temperature conditioning system 350", a "pump 365", a "transducer 320", and "piping 395". So the pressure of the coolant in the chiller reservoir 390 is clearly different from the pressure of the coolant in the container 325.

Also in the Cader et al patent, a second embodiment is shown in Fig. 7. However, the Fig. 7 embodiment has all of the deficiencies of the Fig. 3 embodiment that were described above. In particular, the solenoid valve 785 in Fig. 7 corresponds to the solenoid valve 385 in Fig. 3. The text at lines 6-7 of paragraph 49 says "The pressure inside chamber interior 735 is controlled using solenoid valve 785". However, that valve 785

cannot produce a pressure inside of the container 725 which is sub-atmospheric.

In the present claim 1, the limitation of requiring a pressure reducing means which produces a sub-atmospheric pressure between the container and the IC-module, is very significant. That sub-atmospheric pressure inherently reduces the temperature at which the liquid coolant vaporizes below the temperature of vaporization at atmospheric pressure. This is important because the minimum temperature to which the IC-module can be cooled by the liquid coolant is just slightly above vaporization temperature of the liquid coolant. See the present application line 22 of page 6 to line 13 of page 7.

Thus, when the system of the present claim 1 and the system of Cader et al use the same liquid coolant, the system of the present claim 1 will be capable of cooling the IC-module to a lower temperature. This is because the system of the present claim 1 operates at sub-atmospheric pressures whereas the Cader et al system operates at and above atmospheric pressure due to the solenoid valves 385 in Fig. 3 and 785 in Fig. 7.

Based on the above described differences between the present claim 1 and Cader et al, claim 1 should now be in a condition for allowance. Further, all of the remaining claims 2-13 are dependant on claim 1, so they should also be in a condition for allowance.

Accordingly, entrance of this amendment and an early Notice of Allowance is requested.

Respectfully submitted,

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